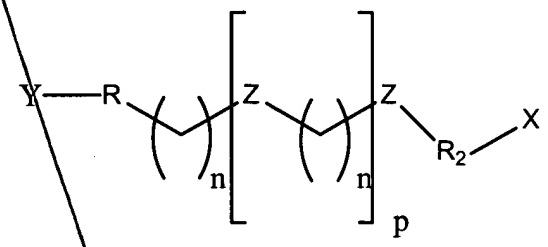
We claim:

1. A nanocrystal linker arm of the following formula:



(I)

n & p = 0-10
Z = O, CH2, or NH

wherein Y represents the attachment point to the nanocrystal and X represents the attachment point of an organic compound;

R is a bond or is selected from the group consisting of:

SH,

$O(CH_{2(n)}O)_nSH$,

$NH(CH_{2(n)}O)_nSH$,

$NH(CH_{2(n)}NH)SH$,

$S(CH_{2(n)}O)_nSH$, and

$S(CH_{2(n)}S)SH$;

n is 1-10; S is the attachment point for the nanocrystal;

R_2 is a bond or selected from the group consisting of

carbonyl,

NH,

SH,

CONH,

COO,

S,

C_{1-10} alkyl,

carbamate, and

thiocarbamate; and wherein

when n and p are 1 or more, the resulting carbon or carbon chain may be substituted.

2. The nanocrystal linker arm of claim 1, where Z is O and n and p are 1-5.

3. The linker arm of claim 1, wherein the attachment point for an organic compound is for an biologically active compound.

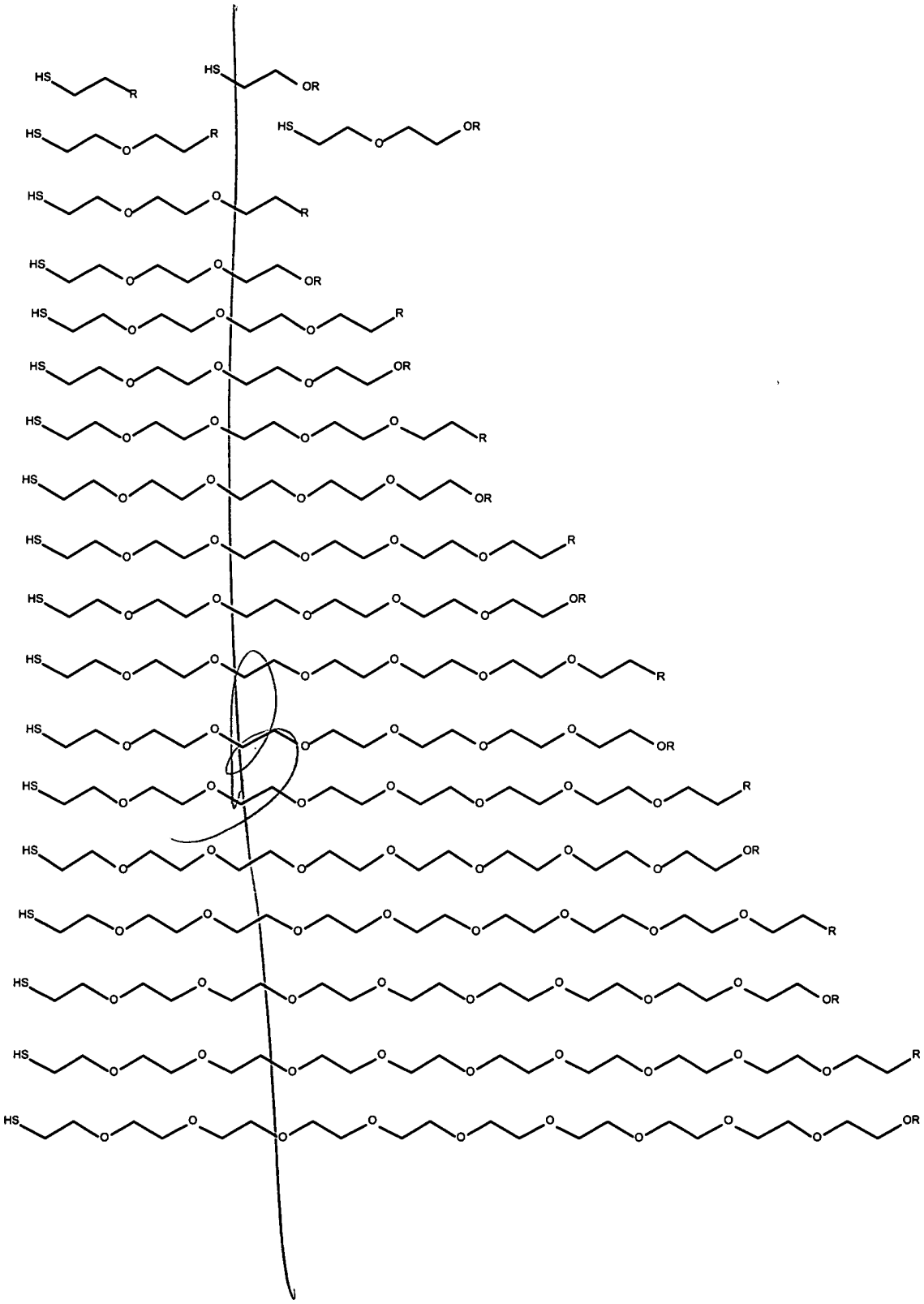
4. The linker arm of claim 1, wherein the attachment point is for organic compounds selected from the group consisting of: seratonin or seratonin derivatives, cocaine analogues, phenyl tropane analogues,

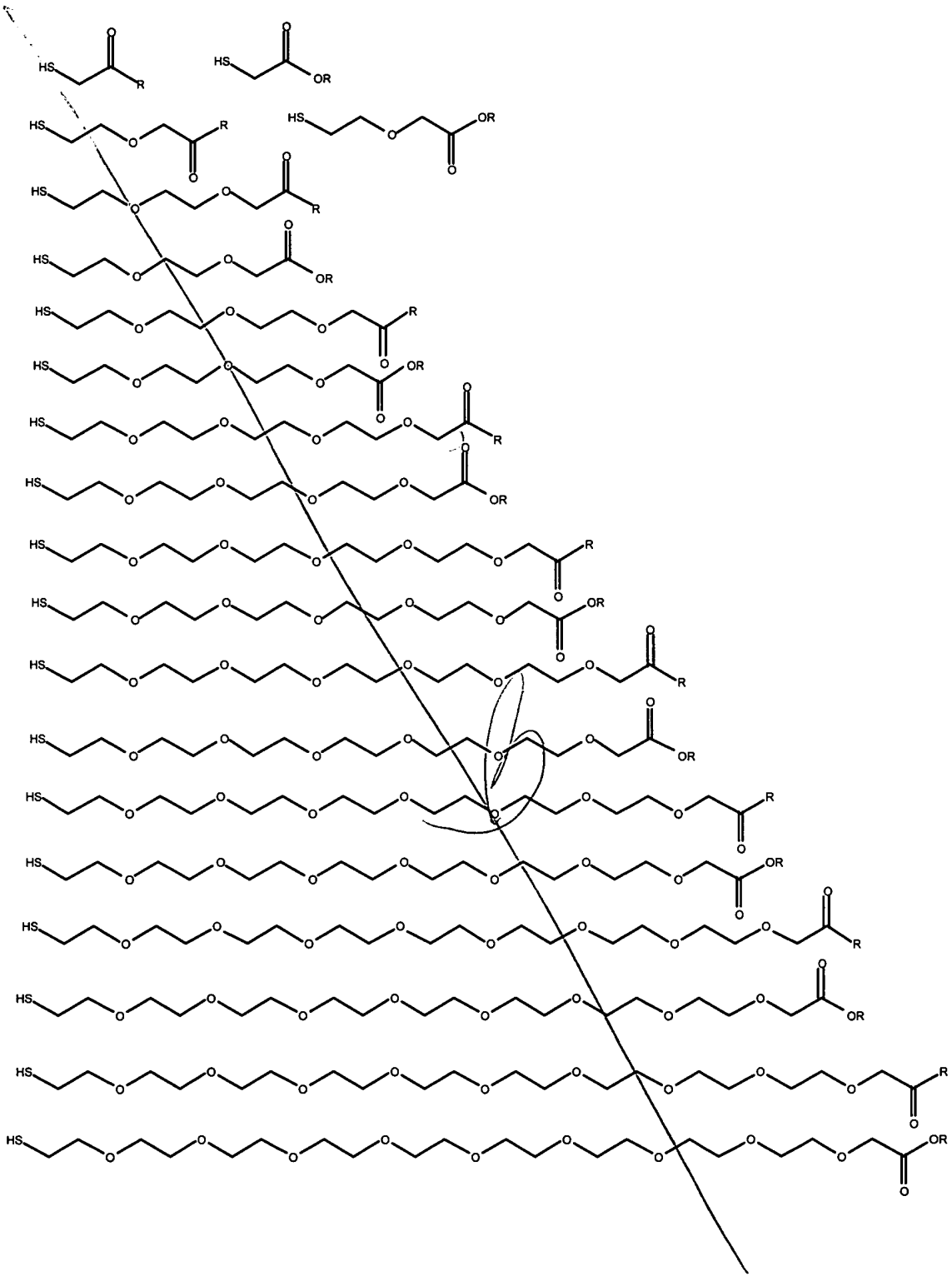
phenylisopropylamine derivatives, dopamine derivatives, melatonin derivatives, chlormethiazole derivatives, derivatives of RTI-4229-75, and derivatives of GBR 12935.

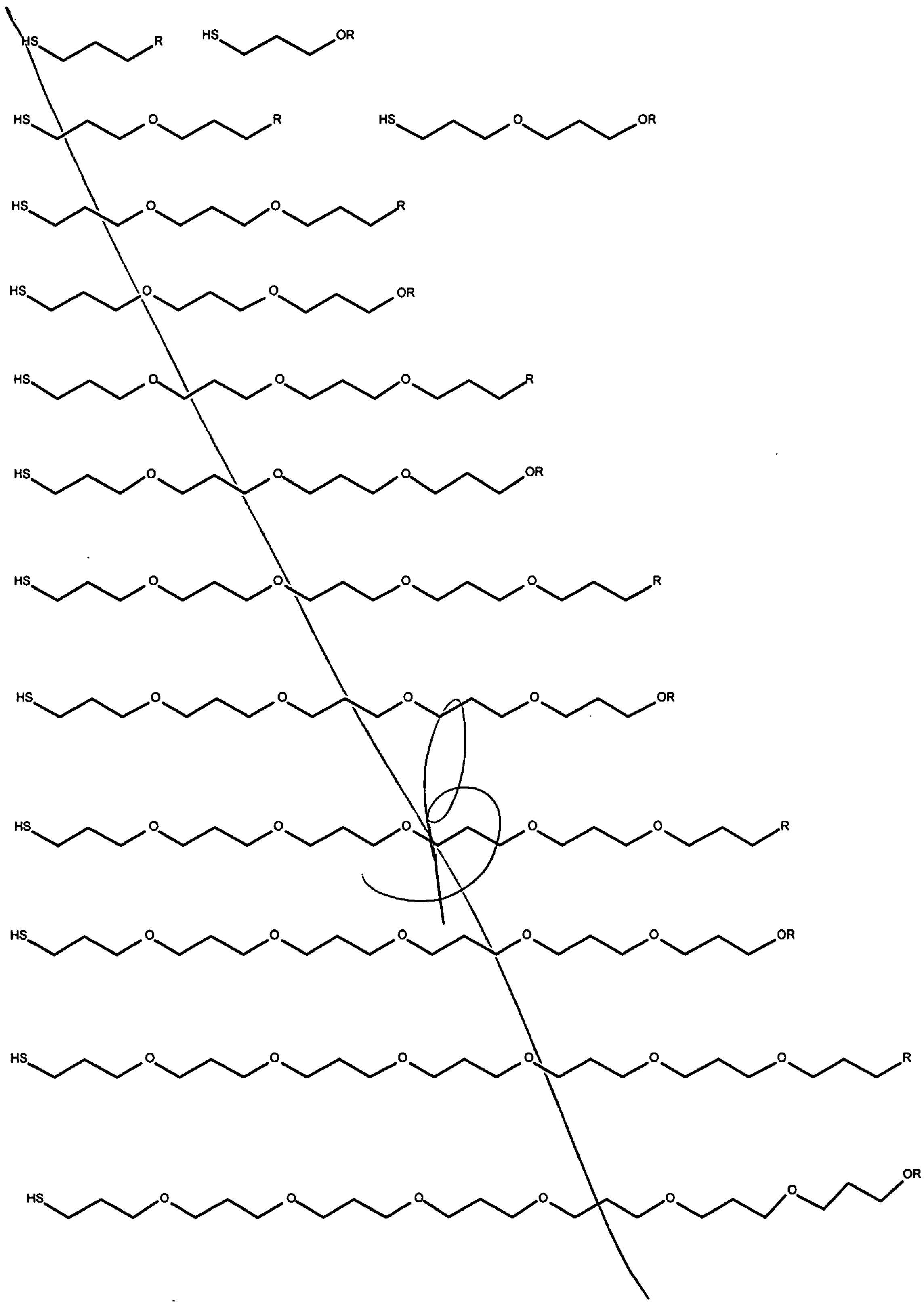
5. The linker arm of claim 1, wherein Y is an attachment point for nanocrystals with cross sections less than about 200 angstroms.

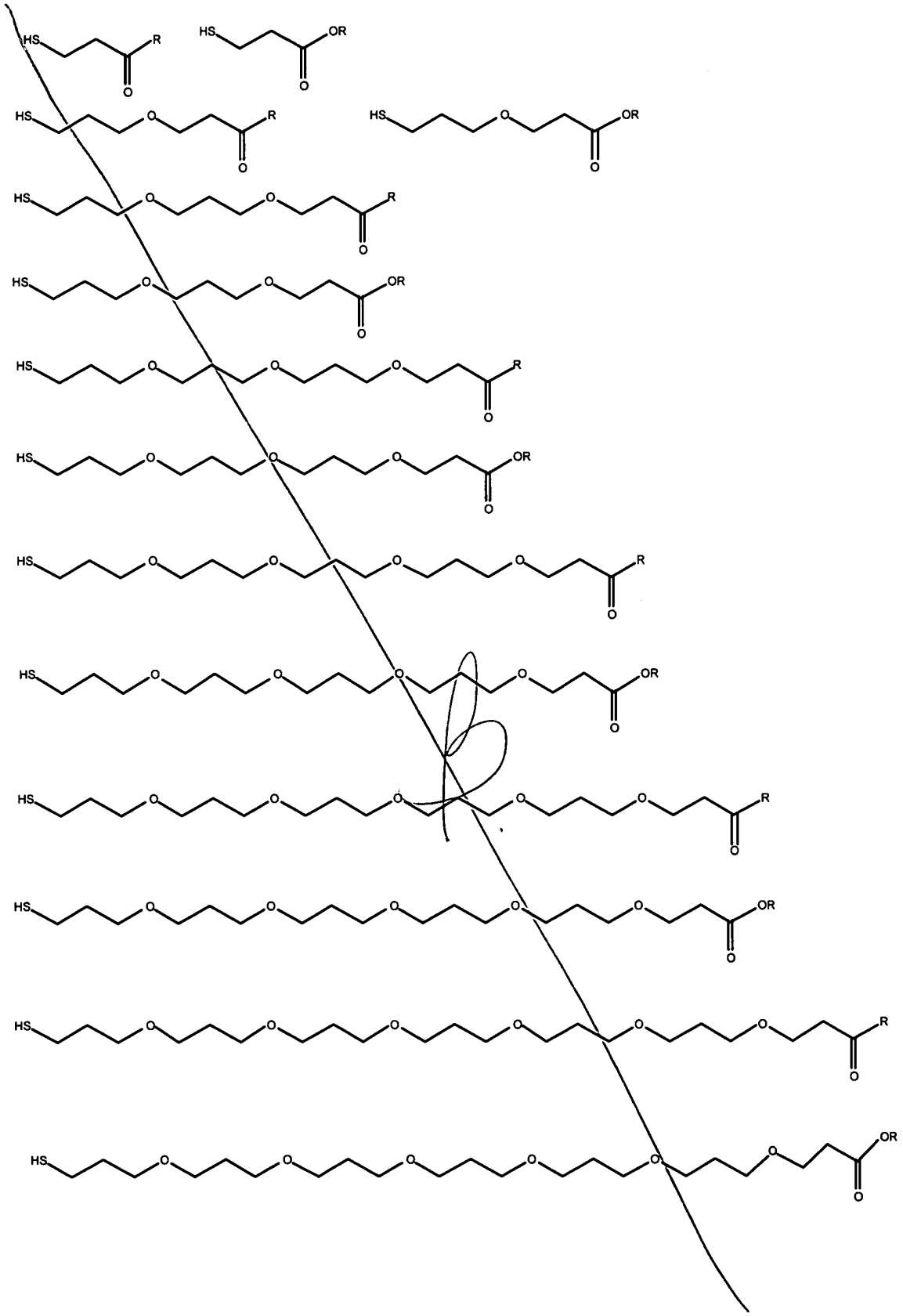
6. The linker arm of claim 1, wherein Y is an attachment point for nanocrystals selected from the group consisting of CdSe, CdS, PbSe, PbS, and CdTe nanocrystals.

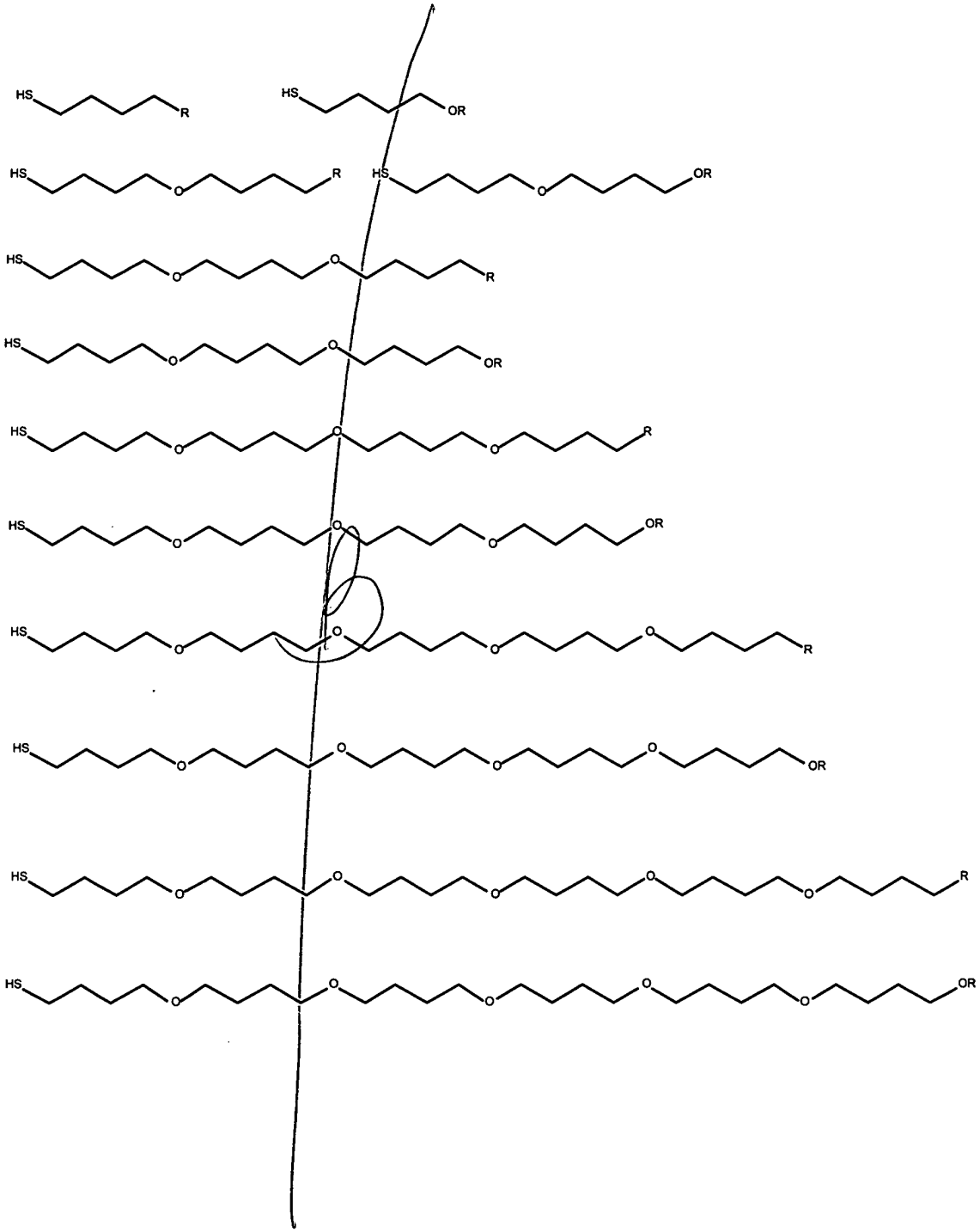
7. The linker arm of claim 1, wherein the linker arm is selected from the group consisting of:


HS
R
OR
O









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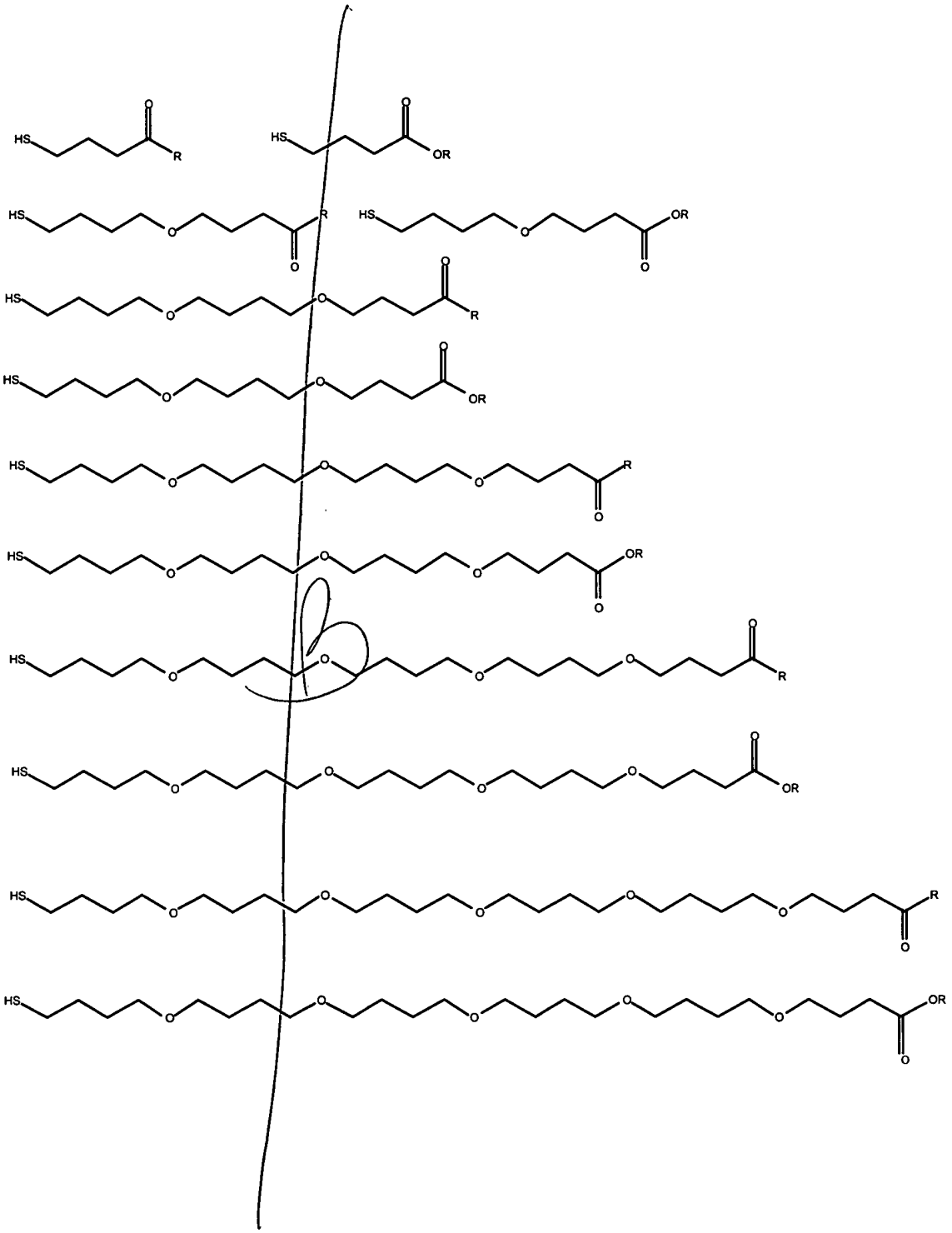

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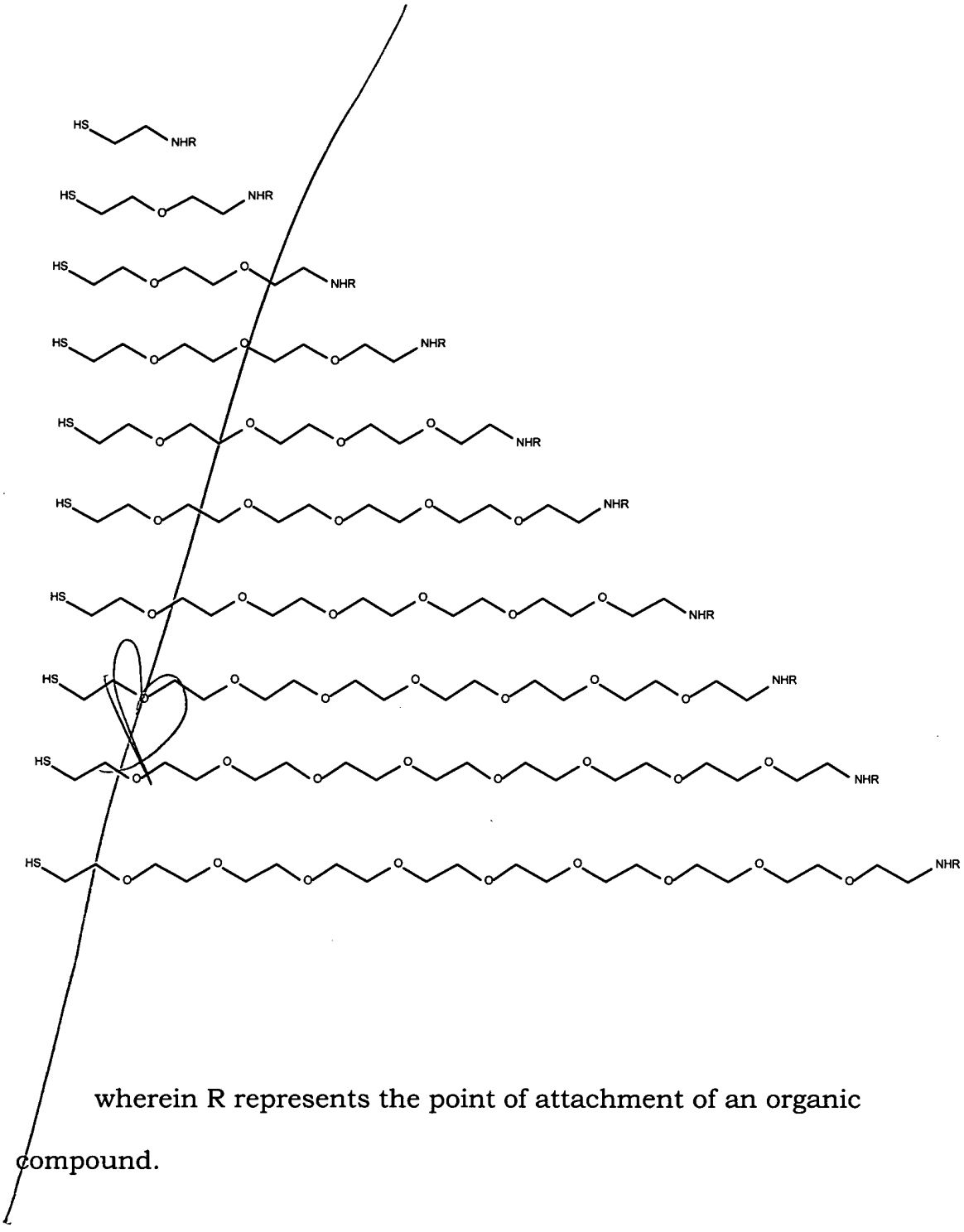
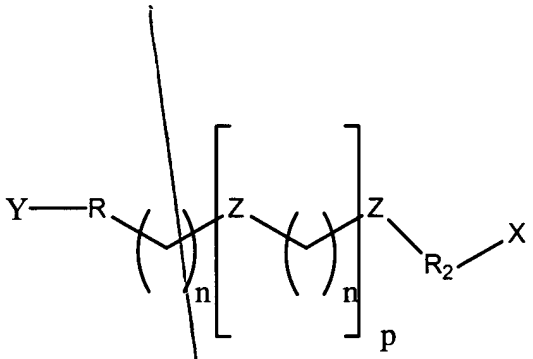


wherein R represents the point of attachment of an organic compound.

8. A nanocrystal compound of the following formula:



(I)

n & p = 0-10
Z = O, CH2, or NH

wherein Y represents the attachment point to the nanocrystal and X represents the attachment point of an organic compound;

R is a bond or is selected from the group consisting of:

SH,

$O(CH_{2(n)}O)_nSH$,

$NH(CH_{2(n)}O)_nSH$,

$NH(CH_{2(n)}NH)SH$,

$S(CH_{2(n)}O)_nSH$, and

$S(CH_{2(n)}S)SH$; n is 1-10, with S being attached to the nanocrystal;

Sub B2

R_2 is a bond or selected from the group consisting of

carbonyl,

NH, SH,

CONH,

COO,

S,

C_{1-10} alkyl,

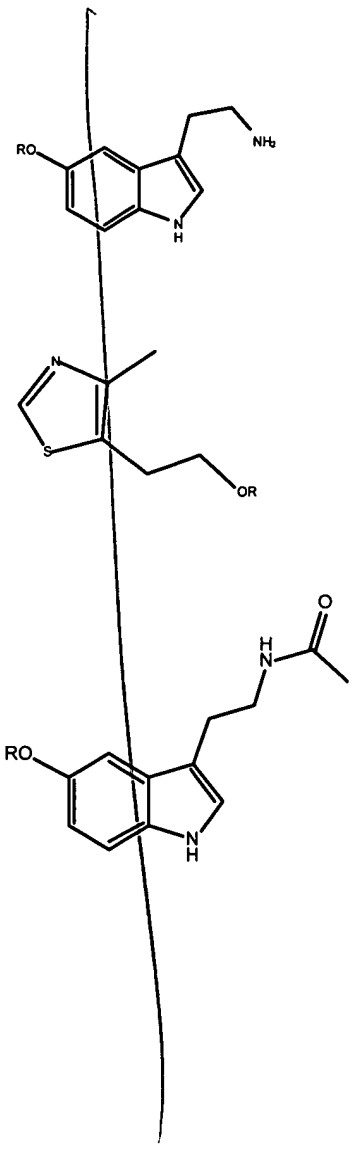
carbamate, and thiocarbamate; and wherein

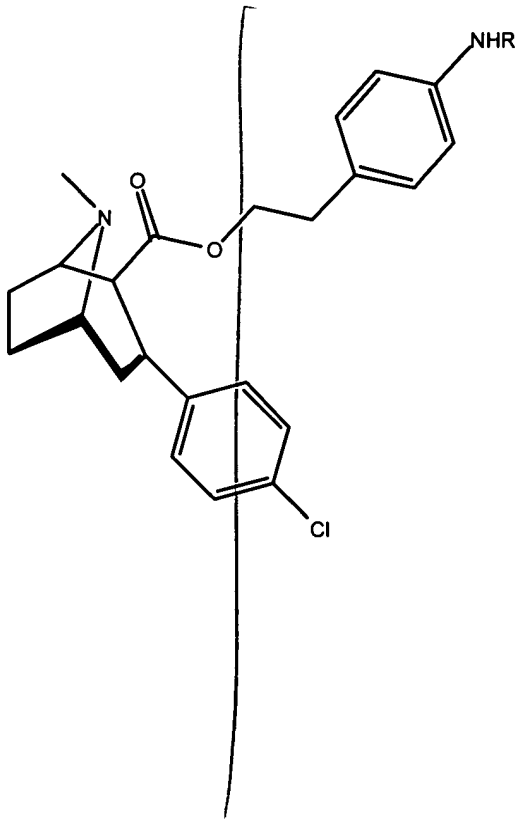
when n and p are 1 or more, the resulting carbon or carbon chain may be substituted.

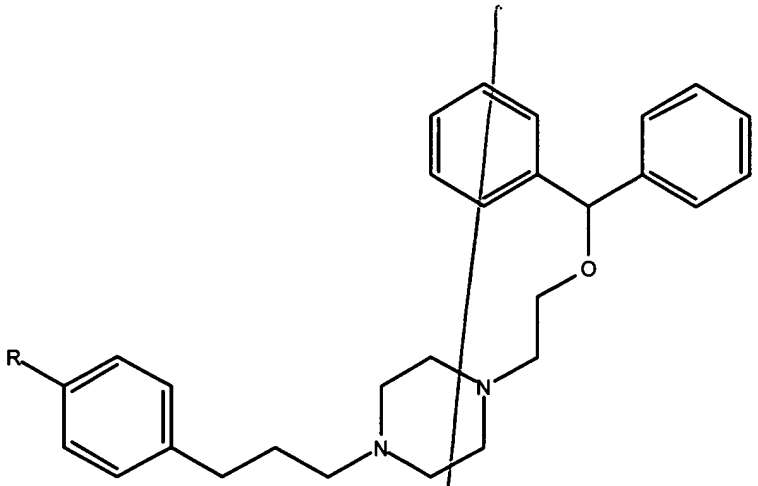
9. The nanocrystal compound of claim 8, wherein the organic compound is selected from the group consisting of: seratonin or seratonin derivatives, cocaine analogues, phenyl tropane analogues, phenylisopropylamine derivatives, dopamine derivatives, melatonin derivatives, chlormethiazole derivatives, derivatives of RTI-4229-75, and derivatives of GBR 12935.

10. The nanocrystal compound of claim 8, wherein the organic compound os selected from the group consisting of:

Sub B2

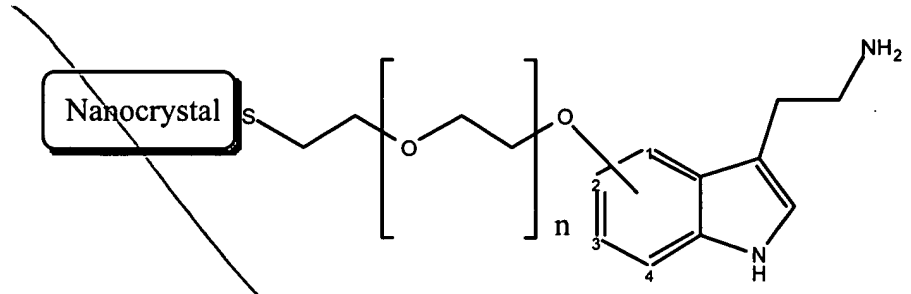




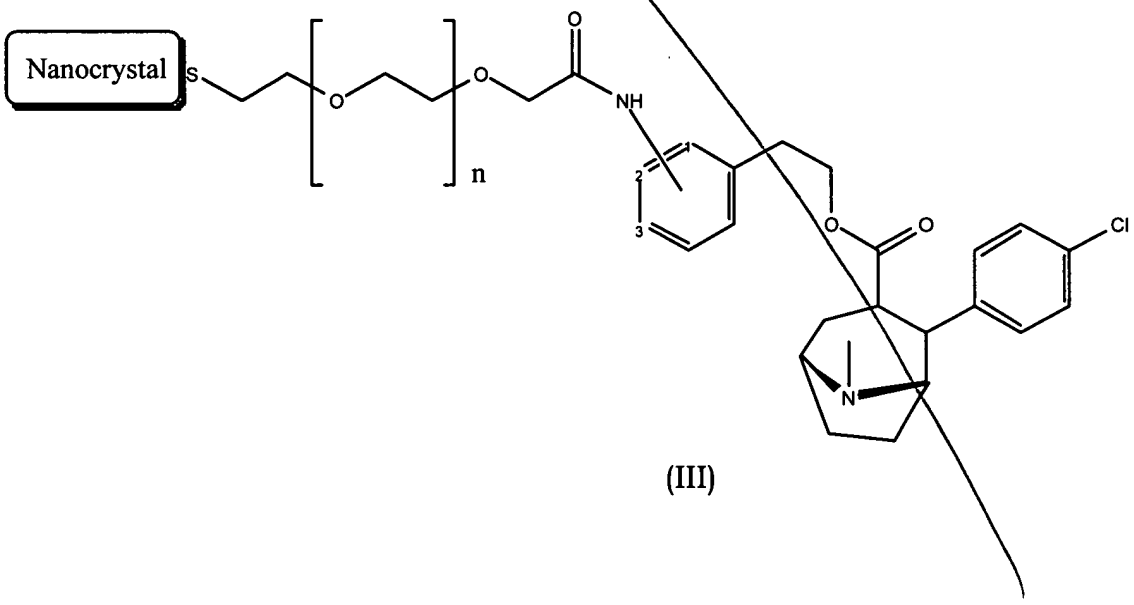


wherein R represents the attachment point to the linker arm.

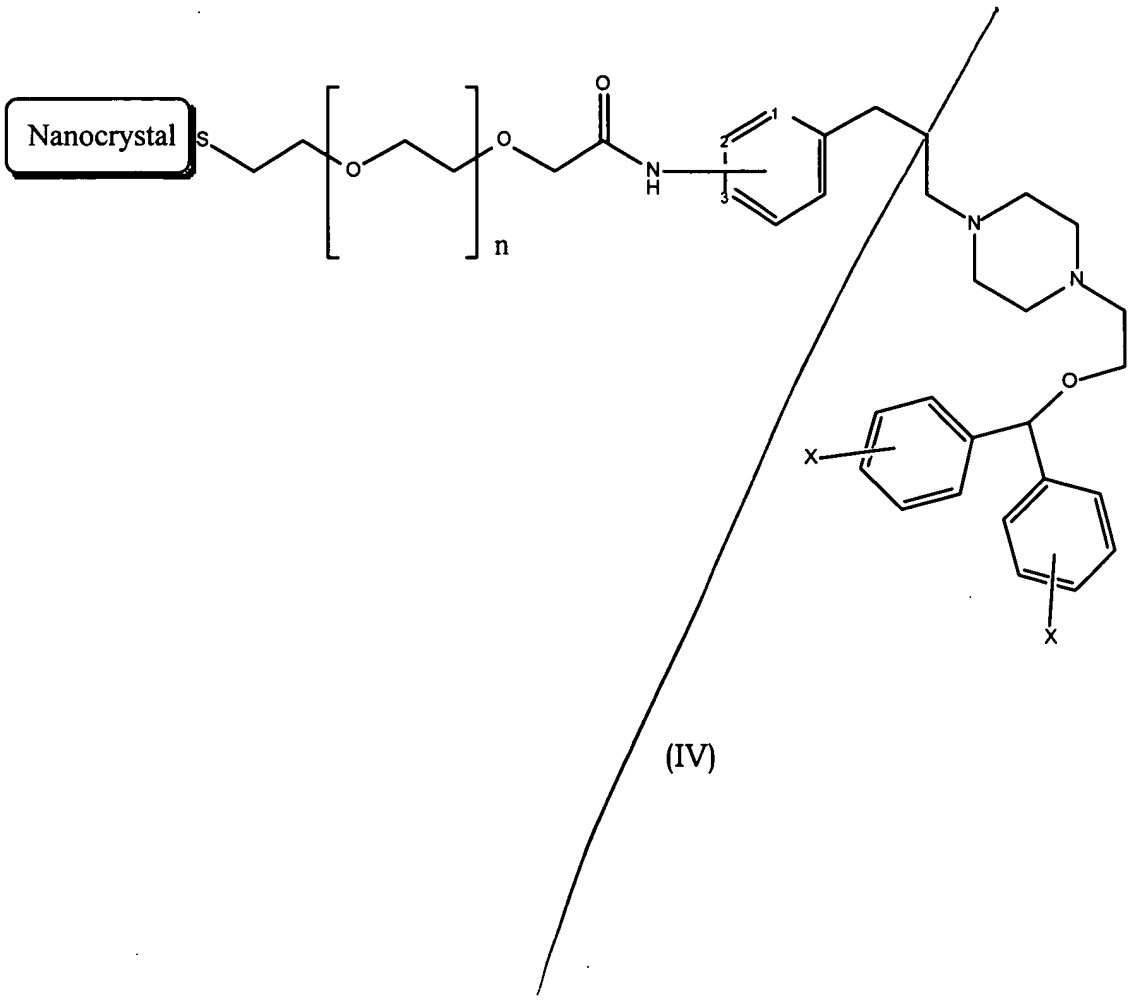
11. The nanocrystal compound of claim 8, selected from the group consisting of:


Nanocrystal
S
O
O
n
NH2
1
2
3
4
N
H

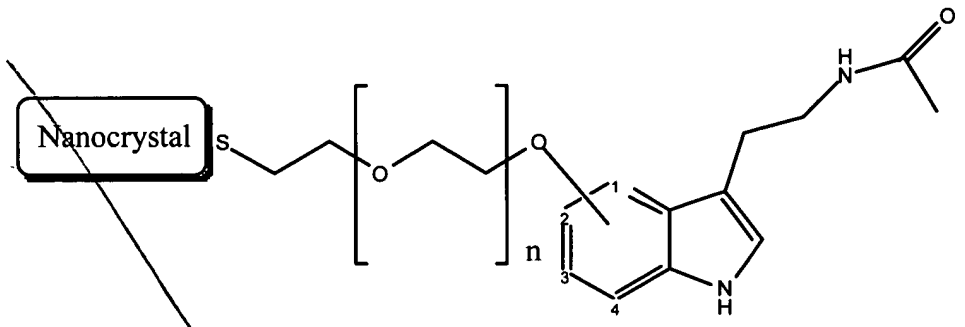
(II)


Nanocrystal
S
O
O
n
O
NH
1
2
3
O
O
Cl
N

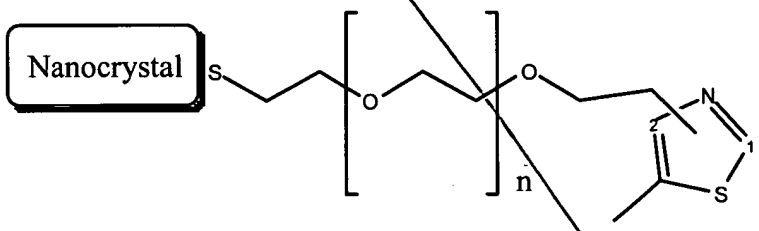
(III)



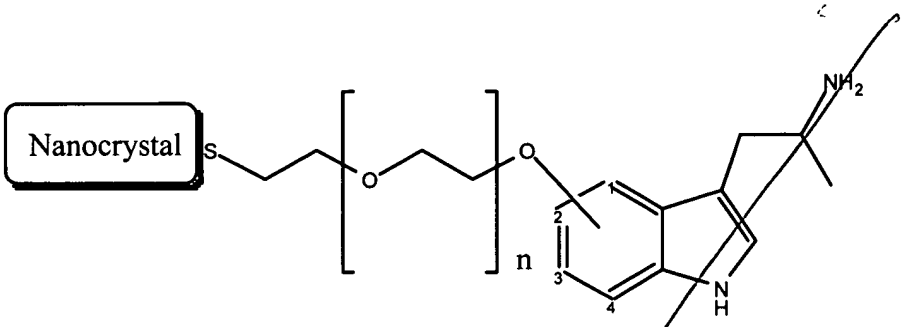
(IV)



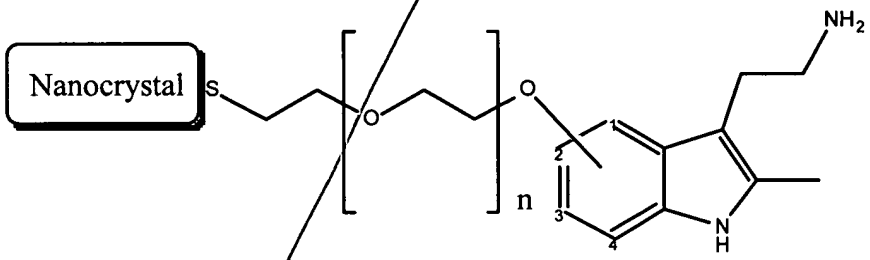
(V)



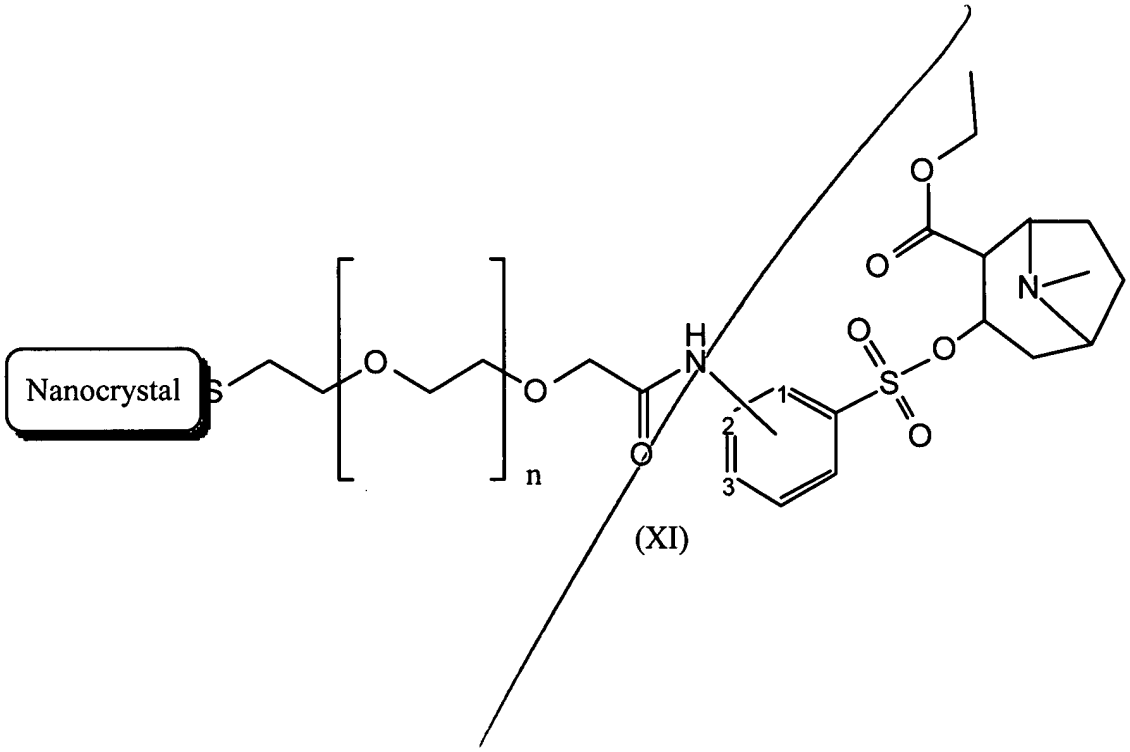
(VI)



(VII)

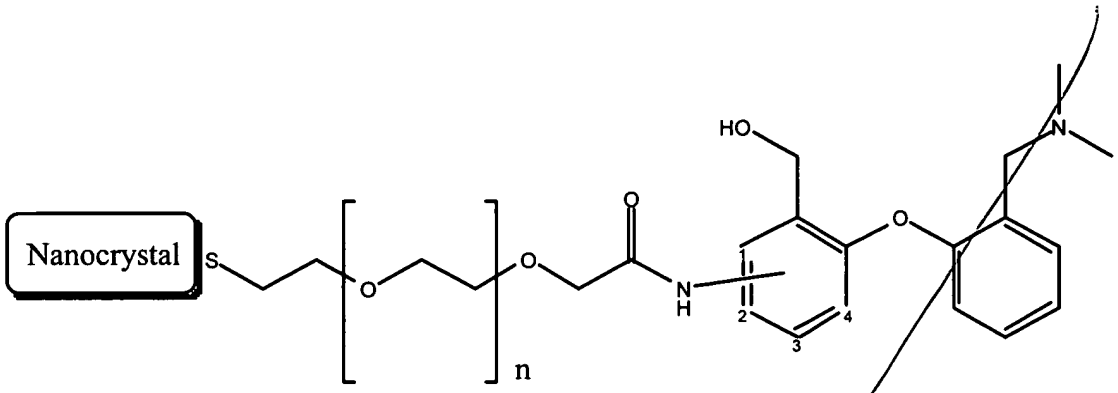


(X)

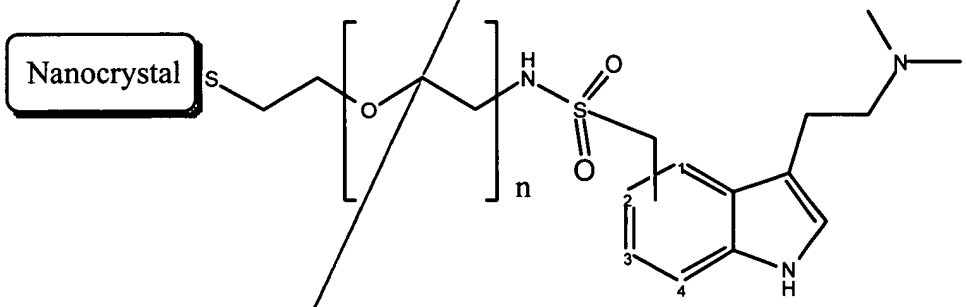


(XI)

Sub B2



(XII)



(XIII)

wherein n = 0-10 and X is H or halogen.

Sub B2

12. The nanocrystal compound of claim 8, wherein the nanocrystal has a cross section of less than about 200 angstroms.

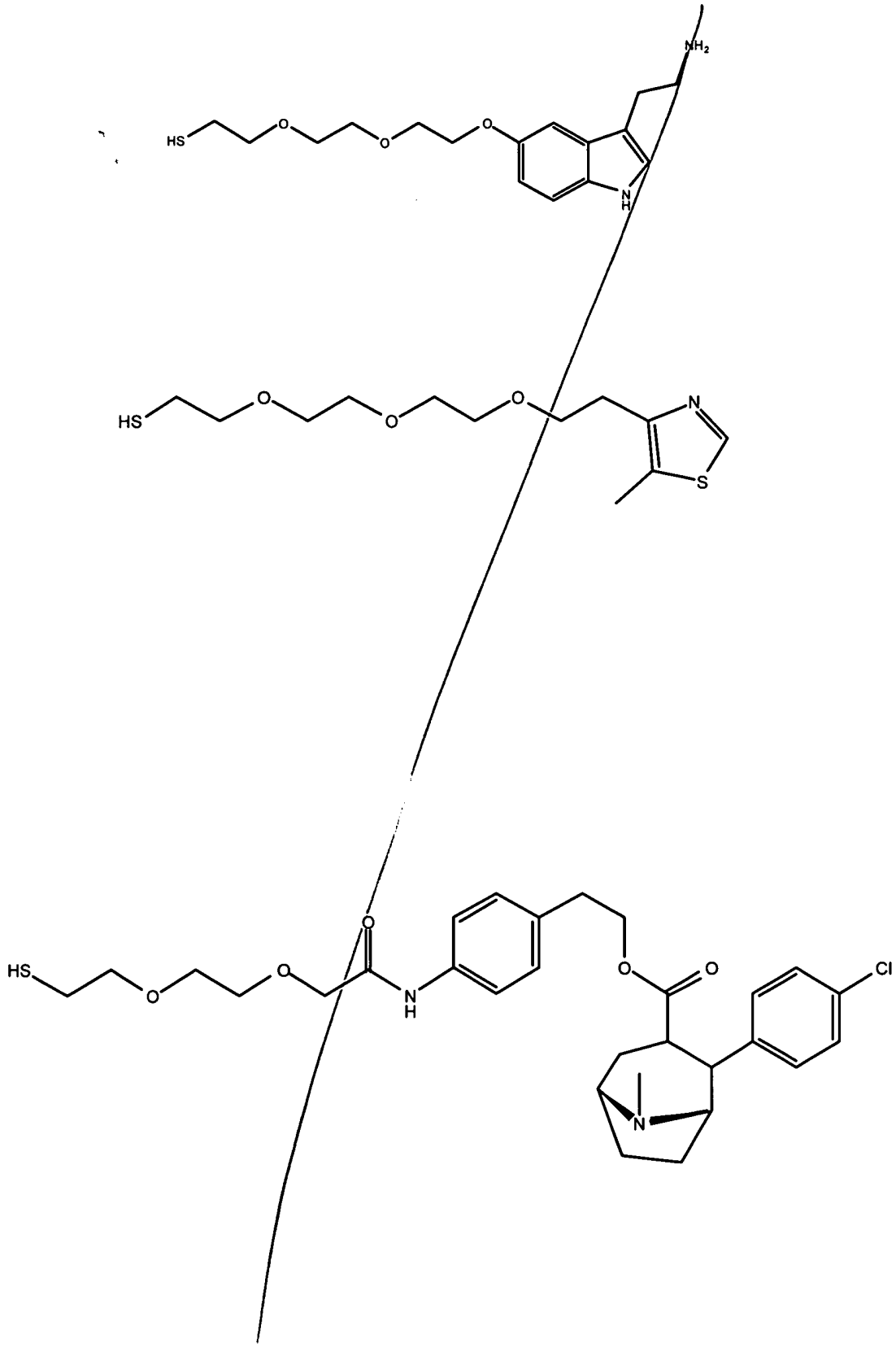
13. The compound of claim 8, wherein the nanocrystal is selected from the group consisting of CdSe, CdS, PbSe, PbS, and CdTe.

14. The compound of claim 8, wherein the organic compound is capable of binding to an affinity molecule, the affinity molecule being a monoclonal antibody, polyclonal antibody, monomeric nucleic acid, oligomeric nucleic acid, protein, polysaccharide, sugar, peptide, drug, ligand.

15. The compound of claim 8, wherein the organic compound is seratonin.

16. The compound of claim 8, selected from the group consisting of:

Sub B2



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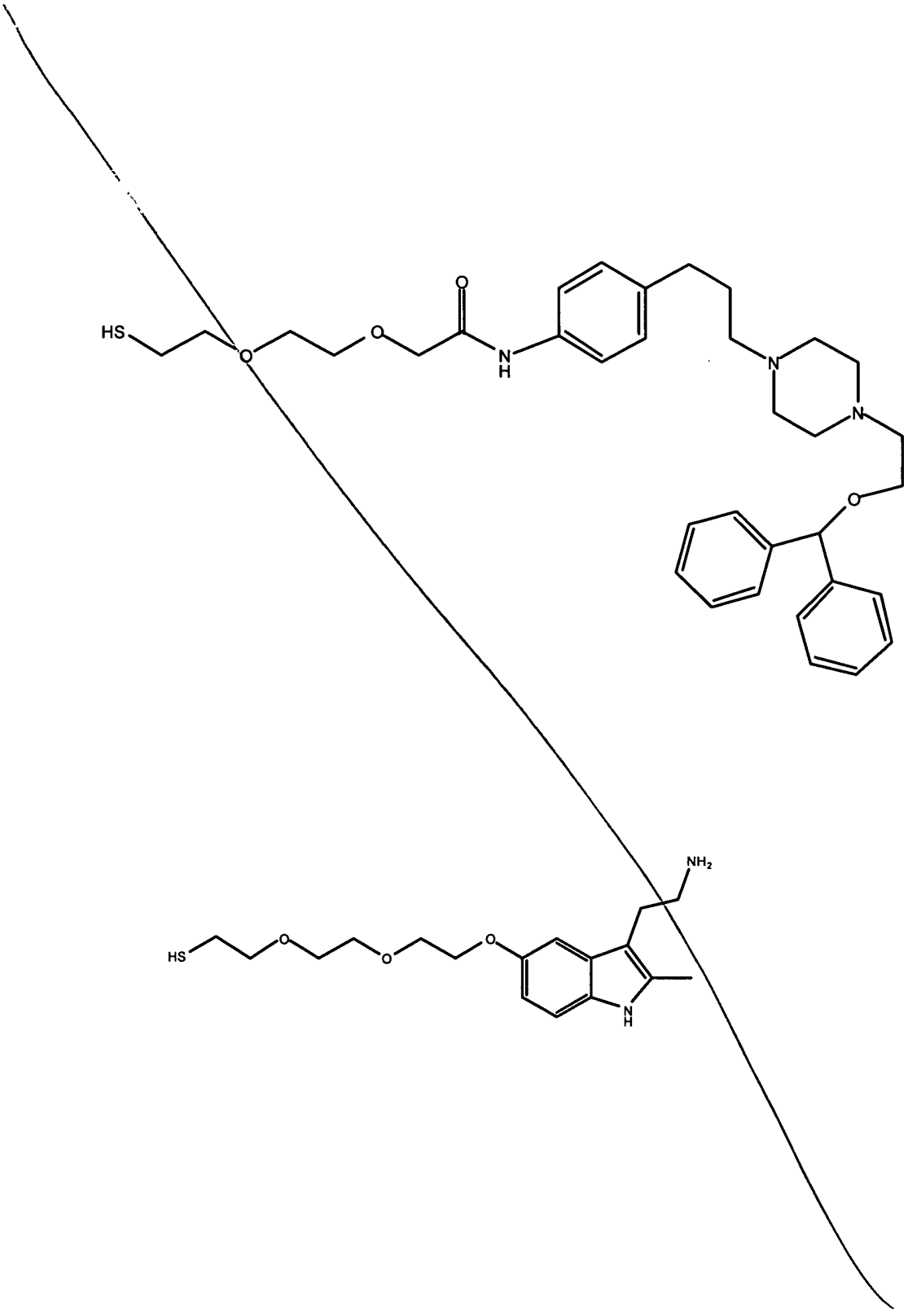
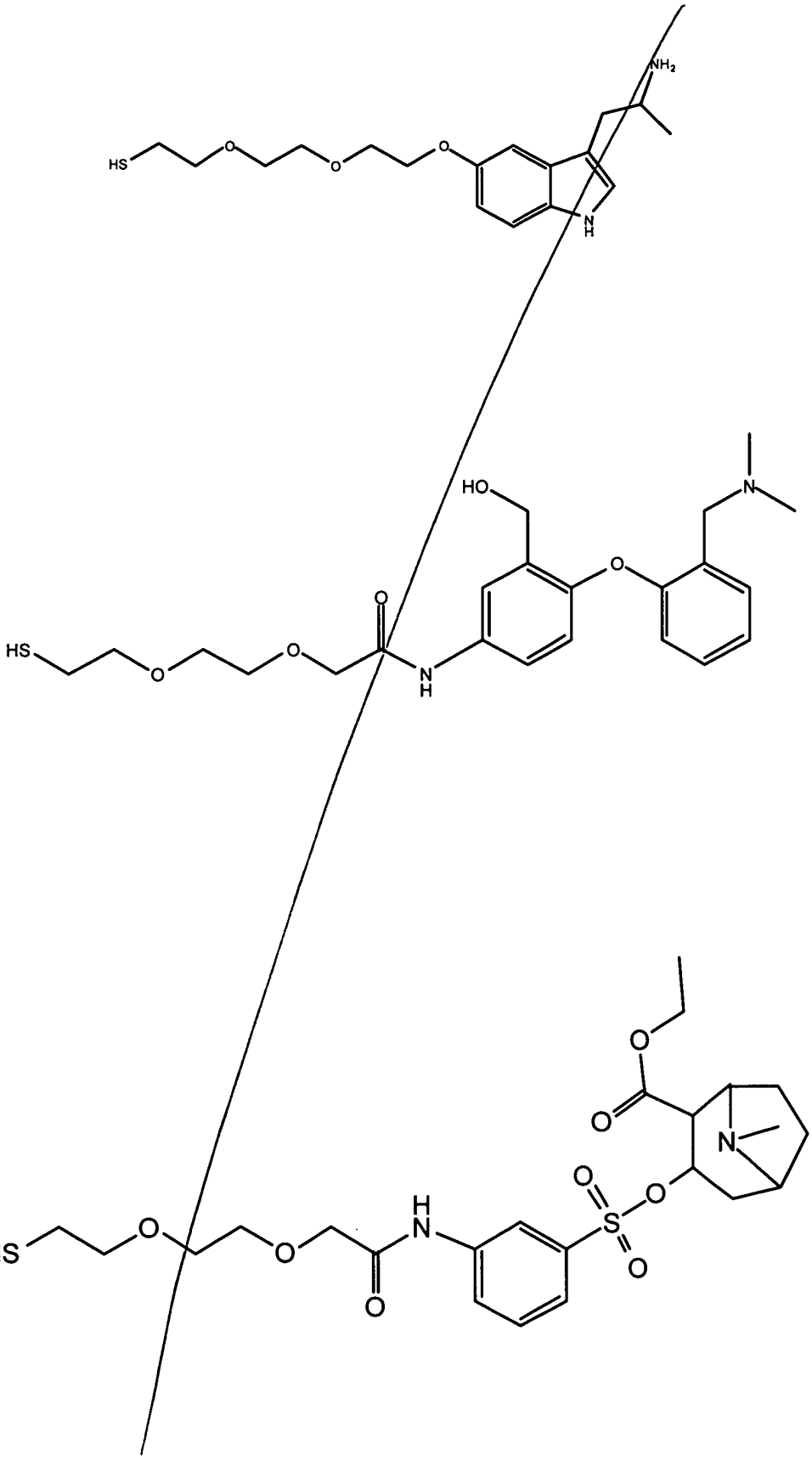
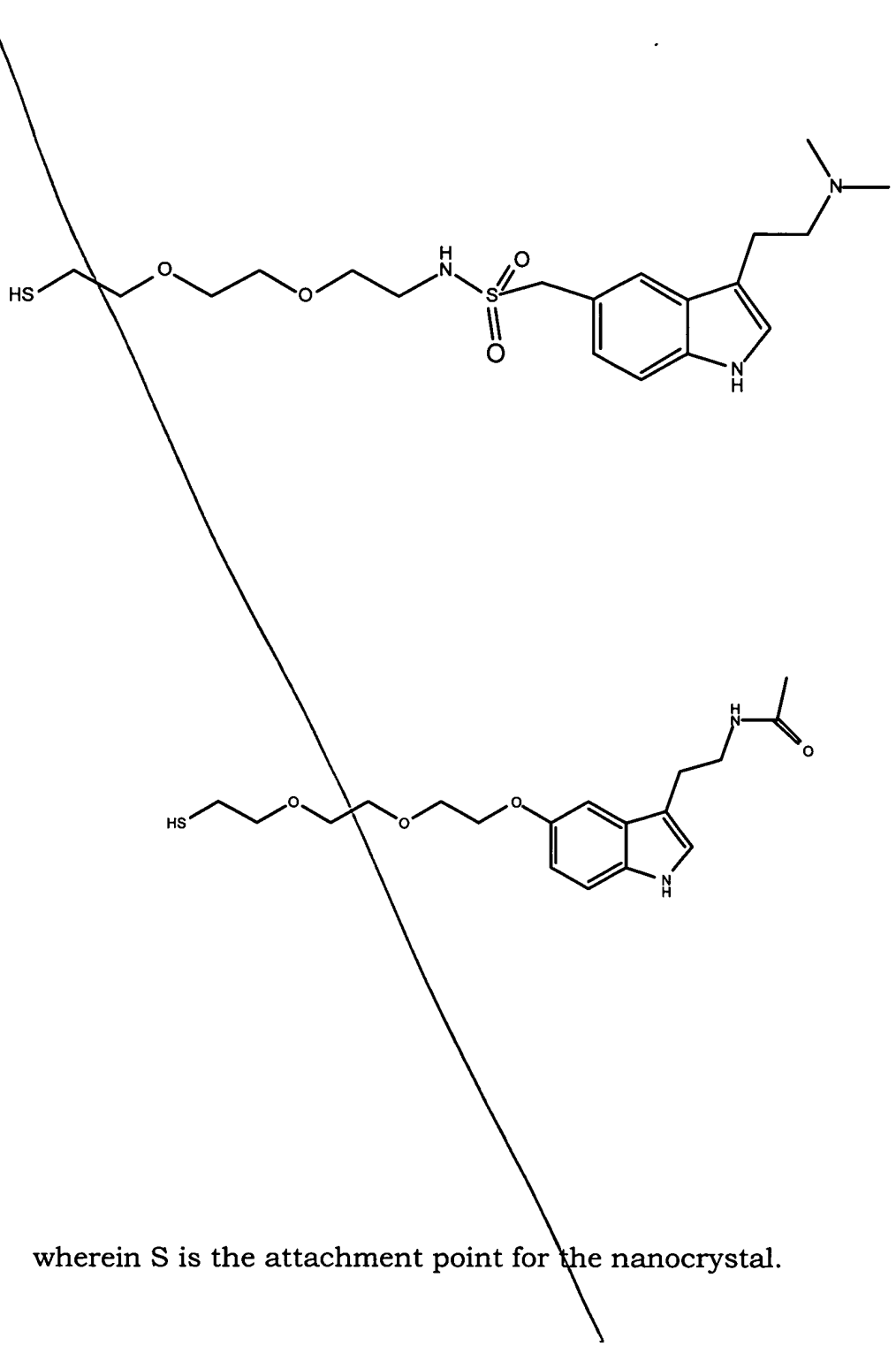
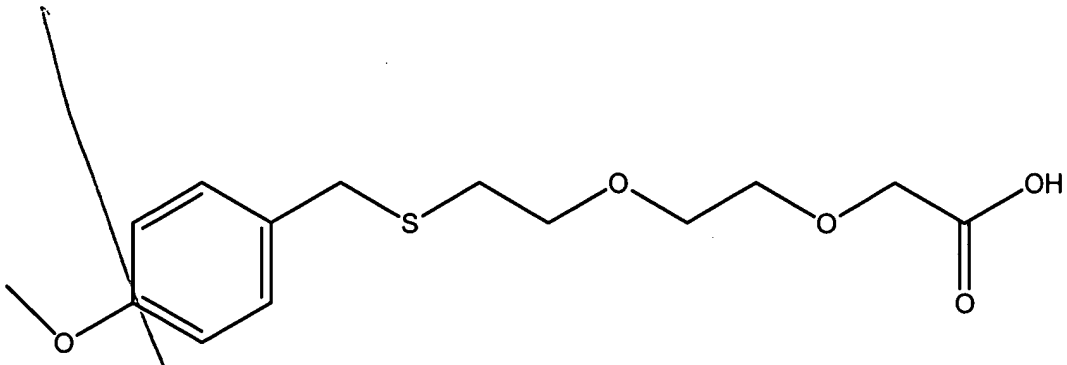

HS
O
O
O
N
H
N
N
O
NH2
HS
O
O
O
N
H


NH2
HS
O
O
O
N
H
HO
N
O
HS
O
O
O
N
H
O
O
HS
O
O
O
H
N
O
S
O
O
N

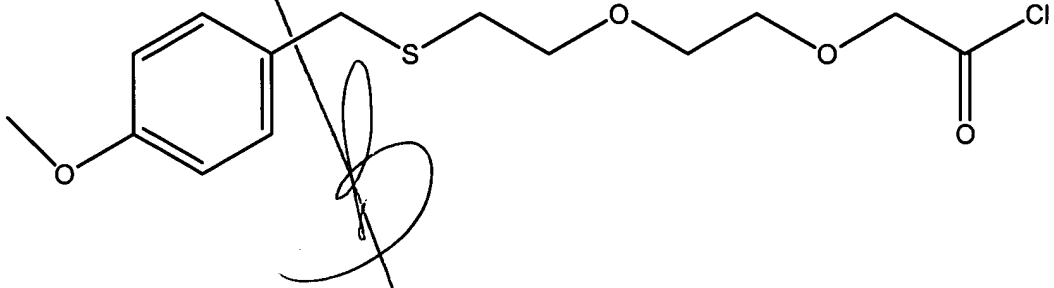


wherein S is the attachment point for the nanocrystal.

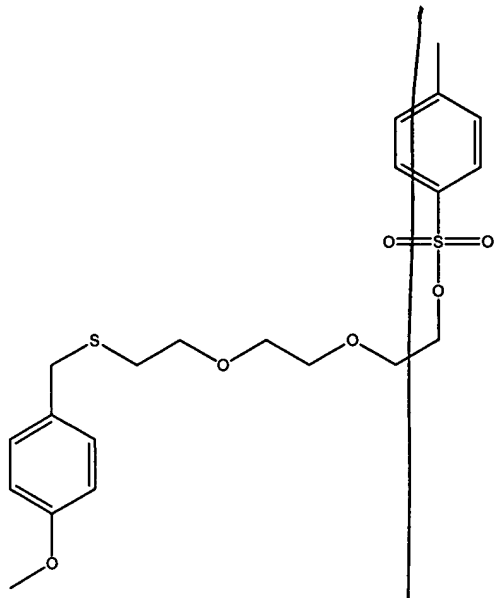
17. A compound of the following formula:



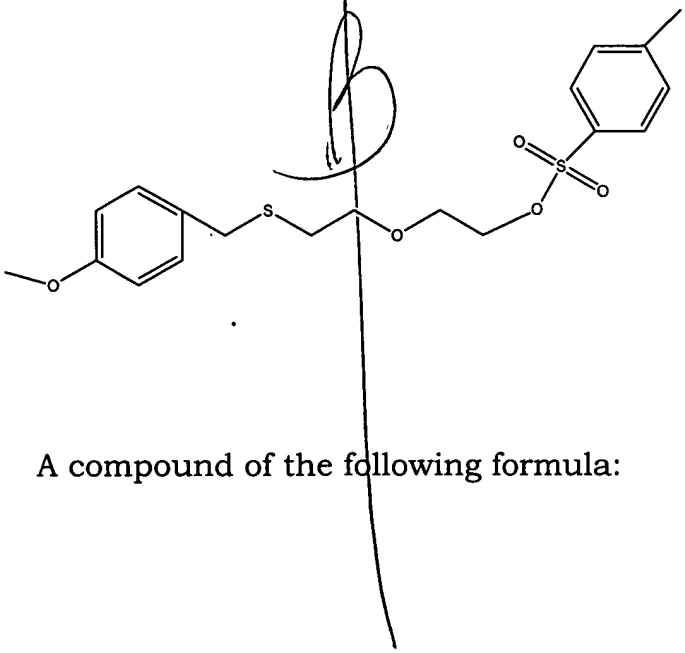
18. A compound of the following formula:



19. A compound of the following formula:



20. A compound of the following formula:



21. A compound of the following formula: